ABSTRACT

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Title of diploma thesis: **Modulatory effects of bilberry extract on the activities and expression of selected biotransformation enzymes in rat**

Bilberry (*Vaccinium myrtillus L., Ericacea*) is one of the richest sources of anthocyanins. These bioactive polyphenolic secondary metabolites give bilberry not only a characteristic blue/black colour, but they are also responsible for many health benefits. Therefore, bilberry has potential use in the treatment and prevention of conditions associated with visual disorders, inflammation, dyslipidemia, hyperglycemia or in some other disorders associated with increased oxidative stress. The aim of this study was to evaluate the effect of bilberry extract, which was administrated for 29 and 58 days, on activity and expression of selected biotransformation enzymes in rat liver. Enzymatic activity and expression of mRNA was determined in the cytosols and microsomes of liver tissue from control and influenced rats. In this study, spectrophotometric or HPLC method was used to measure the activities of aldehyde reductase (AKR1A1), hydroxysteroid dehydrogenase (AKR1C), glutathione-S-transferase (GST), NAD(P)H quinone dehydrogenase (NQO1), carbonyl reductase (CBR), catechol-O-methyltransferase (COMT), UDP-glucurono-syltransferase (UGT) and sulfotransferase (SULT) in subcellular fractions of rat liver tissue. Real-time quantitative PCR was used to determine the transcriptional levels of mRNA of NQO1, CBR1, SULT1A1 and UGT. The results of measurement were statistically compared with the Student's paired *t*-test. The results have shown that bilberry extract does not have a significant effect on the activity and expression of selected biotransformation enzymes in rat liver and therefore the interactions of bilberries with co-administered drugs, metabolized via studied enzymes, are not expected.